An optimality theoretic approach to diphthongization in Rio de Janeiro: The case of stressed word-final syllables

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The near-categorical diphthongization of all vowels before /s/ (realized as the palatal sibilant [ʃ]) in word-final stressed syllables is one of the most salient characteristics of the Portuguese spoken in Rio de Janeiro, Brazil. In this dialect, a high palatal glide /i̯/ appears after the underlying vowel resulting in a falling diphthong (1).

(1) a. 'rapaz' 'boy' [xa.ˈpai̯ʃ]
b. 'arroz' 'rice' [a.ˈxoi̯ʃ]
c. 'capuz' 'hood' [ka.ˈpui̯ʃ]

This presentation approaches word-final diphthongization in Rio de Janeiro Portuguese from an optimality theoretic (OT) perspective. While previous rule-based and OT accounts have attempted to explain why diphthongization occurs (Giangola, 1997; Major, 1985; Reinhardt 1970), I argue that all prior proposals have been unsuccessful for at least one of three reasons: (i) they are unable to explain why diphthongization does not occur word-medially in stressed syllables (e.g. 'pasta', 'folder', [ˈpaʃ.tə]) (Major, 1985; Reinhardt, 1970); (ii) they do not explain the connection between the palatalization of /s/ and the palatal glide /i̯/ (Giangola, 1997; Major, 1985); or (iii) they are unable to account for why a word-final stressed position should motivate diphthongization (Reinhardt, 1970). The OT approach in this presentation builds upon and improves these past approaches. In this presentation, I provide evidence and argue for a high-ranking constraint Weight-to-Stress/Stress-to-Weight[1] (WSP) which states that syllables with primary stress must be bimoraic. I claim that this constraint may be satisfied either by a stressed, closed syllable (e.g. 'dar', 'to give', [ˈdax]) or through the lengthening of a stressed vowel[2] in an open syllable (e.g. 'pá', 'shovel', [ˈpa:]). In theory, a moraic coda /s/ would result in a bimoraic syllable if preceded by a monomoraic vowel. That is, examples such as those in (1) initially appear to satisfy this constraint. However, I argue that the constraint (*[s/ʃ]μ#) requires word-final coda [s] and [ʃ] to be treated as non-moraic in Brazilian Portuguese. This is based on crosslinguistic evidence according to which /s/ is often extrametrical and because the only additional element permitted after a bimoraic syllable structure in Brazilian Portuguese is /s/. Thus, the insertion of a mora after a stressed monomoraic vowel and before word-final [s]/[ʃ] is the only way to satisfy WSP (3) which must dominate DEP-μ, as well as the rest of the constraints. I conclude that the epenthesized mora always emerges as the palatal high glide [i̯] in this dialect because the mora receives featural content from the adjacent consonant, in the case of the Rio de Janeiro dialect, the palatal sibilant [ʃ]. This account also explains why epenthesis does not occur word-medially. Because *[s/ʃ]μ# only affects word-final codas, WSP is able to be satisfied without epenthesis (4). Additionally, this analysis explains why the palatal high glide [i̯] does not appear outside of Rio de Janeiro. Although all dialects exhibit mora epenthesis (violation of Dep-μ), the lack of /s/ palatalization in other dialects prevents the spread of [+hi] from the consonant to the epenthetic mora (5). Because of high-ranking DEP-feat which dominates * LONG, a geminate is predicted to surface in these varieties.

(2) Relevant constraints

[1] The Weight-to-Stress principle generally refers to the observation that heavy syllables attract primary stress (Prince, 1990). The current analysis contains the mirror image of WSP, which requires that stressed syllables be heavy.

[2] This presentation assumes that all vowels are moraic V/μ.

- ʃ/coda - Coda /s/ is a palatal in the coda (combination of *s/coda >> IDENT/PLACE).
- *[s/ʃ]μ# - Word-final sibilants [s] and [ʃ] are not moraic.
- Weight-to-Stress/Stress-to-Weight (WSP) - Stressed syllables must be bimoraic.
- DEP-feature - Features cannot be inserted.
- *LONG - No geminates.
- DEP-μ - Moraic segments cannot be inserted.
- *LINK - No shared association lines/features.

(3) 'rapaz'/xapas/	ʃ/coda	*[s/ʃ]μ#	WSP	DEP-feat	*LONG	*LINK	DEP-μ
xa.pas	*!		*				
xa.paʃ | μ		*!					*
xa.pa:ʃ					*!		*
xa.pa̯ʃ				*!			*
→ xa.pa̯iʃ						*	*

(4) 'pasta' /pas.tə/	ʃ/coda	*[s/ʃ]μ#	WSP	DEP-feat	*LONG	*LINK	DEP-μ
pas.tə	*!						
→ paʃ.tə | μ							*
pa:ʃ.tə					*!		*
pauʃ.tə				*!			*
paiʃ.tə						*!	*

(5) 'rapaz'/xapas/	*[s/ʃ]μ#	WSP	DEP-feat	*LONG	*LINK	DEP-μ	ʃ/coda
xa.pas		*!					*
xa.pas | μ	*!					*	*
→xa.pa:s				*!		*	*
xa.pa̯us			*!			*	*
xa.pa̯is			*!			*	*

Selected References:

Giangola, J. P. (1997). Constraint Interaction and Brazilian Portuguese Glide Distribution. *North East Linguistics Society*, *27*, 1–16; Major, R. C. (1985). Stress and rhythm in Brazilian Portuguese. *Language*, *61*(2), 259–282; Prince, A. (1990). Quantitative consequences of rhythmic organization. Chicago Linguistic Society, 26(2), 355–398; Reinhardt, K. J. (1970). Intrusive /i̯/before /s/ in Brazilian Portuguese. *WORD*, *26*(1), 101–106.